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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] Specifically, this invention relates to the method of manufacturing continuously the metallic foil tension laminate sheet with which a printed wired board etc. are presented, about the manufacturing method of a laminate sheet.

[0002]

[Description of the Prior Art] In the manufacturing method of the conventional metallic foil tension laminate sheet, a woven glass fabric, a nonwoven glass fabric, Two or more necessary number of sheets is laminated extracting resin for the resin impregnation substrate obtained by impregnating resin to this substrate with a squeeze roll using substrates, such as paper, A long metallic foil on further one surface at other one side A long mold releasing film. Or a long metallic foil is piled up, and the method of curing oven cutting after heat cure and to a necessary size, and manufacturing a metallic foil tension laminate sheet continuously is known, moving continuously the layered product band-like [long] which carried out laminate integration through between the laminate rollers allocated up and down.

[0003]However, in said continuous manufacturing method, internal stress started the layered product under hardening, and it had a problem which the curvature of a laminate sheet and torsion produce.

[0004]

[Problem(s) to be Solved by the Invention] Then, in the method of manufacturing a laminate sheet continuously, there is this invention in providing the manufacturing method of the metallic foil tension laminate sheet which can prevent the curvature of a laminate sheet, and torsion.

[0005]

[Means for Solving the Problem] After a manufacturing method of a laminate sheet concerning claim 1 of this invention carries out laminate integration shaping of a resin impregnation

substrate of two or more sheets, and the outermost layer metallic foil with non-pressure heating, it applies a fixed time pressure, cuts after re-hardening and this layered product to a necessary size, and manufactures a laminate sheet continuously.

[0006]After a manufacturing method of a laminate sheet concerning claim 2 of this invention carries out laminate integration shaping of a resin impregnation substrate of two or more sheets, and the outermost layer metallic foil with non-pressure heating, it applies a fixed time pressure and heat, cuts this layered product to a necessary size, and manufactures a laminate sheet continuously.

[0007]

[Function]After carrying out laminate integration shaping of the resin impregnation substrate of two or more sheets, and the outermost layer metallic foil with non-pressure heating according to the manufacturing method of the laminate sheet concerning claim 1 of this invention, Since a fixed time pressure is applied, after re-hardening and this layered product are cut to a necessary size, a laminate sheet is manufactured continuously, a uniform pressure is added to a layered product (1) after hardening and internal stress does not start, the curvature of a laminate sheet and torsion can be prevented.

[0008]After carrying out laminate integration shaping of the resin impregnation substrate of two or more sheets, and the outermost layer metallic foil with non-pressure heating according to the manufacturing method of the laminate sheet concerning claim 2 of this invention, Since a fixed time pressure and heat are applied, this layered product is cut to a necessary size, a laminate sheet is manufactured continuously, a uniform pressure is added to a layered product (1) after hardening and internal stress does not start, the curvature of a laminate sheet and torsion can be prevented.

[0009]Hereafter, this invention is explained in detail based on a drawing. Drawing 1 is a sectional view of one example of this invention.

[0010]The manufacturing method of the laminate sheet of this invention carries out unification shaping of a resin impregnation substrate and the outermost layer metallic foil with non-pressure heating. The thing which had the above-mentioned resin impregnation substrate and the outermost layer metallic foil unified is in a layered product (1) very.

[0011]First, a resin impregnation substrate and an outermost layer metallic foil are made to unify, and a laminate roller (5) is used for using a layered product (1). This laminate roller (5) can use suitably what carried out covering coating of rubber or the synthetic resin for metal, such as stainless steel, the product made of rubber, the product made of a synthetic resin, or the metallic roll surface.

[0012]The cash-drawer roll (2) which pulls out the layered product (1) in which the device used for the manufacturing method of the laminate sheet of this invention appeared from the curing oven (4) which carries out cure molding of the layered product (1) is formed. a cash-drawer roll

(2) -- a laminate roller (5) -- what carried out covering coating of rubber or the synthetic resin can be suitably used for metal, such as stainless steel, the product made of rubber, the product made of a synthetic resin, or the metallic roll surface in a similar manner.

[0013]Curing oven (4) is used for carrying out cure molding of the layered product (1). Although the curing conditions of this curing oven (4) can choose curing temperature and cure time according to the kind of impregnating resin, hardening can be performed by non-pressure thru/or 20 kg/cm². After cutting is preferred although cooling after afterbaking and to below heat deflection temperature more than the heat deflection temperature of the used resin makes curvature and torsion small. It is preferred especially to quench cooling. When a mold releasing film is used, curvature can be lessened more by removing a mold releasing film after cooling.

[0014]A substrate band-like [long] can be impregnated with the aforementioned resin impregnation substrate in resin, it can be stiffened behind, and can form an insulating layer. As a substrate band-like [long], inorganic fibers, such as glass, polyester, a polyacrylic, The textile fabrics, the nonwoven fabrics, the mats or papers which consist of natural fibers, such as organic synthesis textiles, such as polyvinyl alcohol, polyamide, polyimide, a polyphenylene ape fight, and urethane, and cotton, or these combination substrates can be used.

[0015]As a resin composition impregnated with said substrate, unsaturated polyester resin, It can impregnate with independence, such as an epoxy resin, polyimide resin, a fluoro-resin, phenol resin, and polyphenylene oxide resin, a denaturation thing, and a mixture so that a resin amount may be 40 to 60% of the weight (it is only described as % below), and they can be used. resin impregnation -- being primary impregnated -- affiliated resin or a different system -- since it can carry out being uniform impregnated of carrying out with low viscosity resin of resin more, it is desirable. To a resin composition, one to 200 weight section can also be added for bulking agents, such as aluminium hydroxide, clay, talc, silica, alumina, magnesium carbonate, calcium carbonate, synthetic resin powder, and a hollow body, to resin 100 weight section if needed. A resin composition is desirable when using after carrying out vacuum defoaming preferably, although it may use as it is stops gassing in a resin impregnation substrate. It is preferred to impregnate a nonwoven fabric substrate with the resin composition containing said bulking agent.

[0016]

[Example]Hereafter, the example of this invention is given.

[0017]As example 1 resin composition, vinyl-ester-resin (Showa High Polymer Co., Ltd. make R-806DA) 100 commercial weight section, Before impregnating continuously two glass cloth base materials (Nitto Boseki Co., Ltd. make WE-18 K-BS) which become a surface and a lining with the resin composition which added styrene and going into a squeeze roll (not shown) so that the viscosity of 25 more ** may be 5 poise at KUMERU hydroperoxide 1 weight section,

Resin is extracted as a resin amount will be 30% with a resin diaphragm roll. Three nonwoven glass fabric substrates (EP-4035 by Japan Vilene Co., Ltd.) of the shape of isomorphism which forms a core layer were impregnated with the resin composition which contains aluminium hydroxide 45 weight section and clay 30 weight section to resin 100 weight section of said resin composition so that a resin amount might be 55% continuously. When you make it impregnated, said glass cloth base material is arranged at the both sides of the nonwoven glass fabric substrate of three sheets. The resin composition impregnated too much is extracted to each resin impregnation substrate with a squeeze roll. As the resin impregnation substrate unified with the squeeze roll was arranged inside in the 18-micrometer-thick adhesives side of copper foil with adhesives next at the both sides of the outside, it sent these in continuously between one pair of laminate rollers (5), it laminated them with low pressure, and was made into the layered product (1) band-like [long]. After having sent this layered product (1) into curing oven (4), carrying out heat cure without pressure for 100 ** and 20 minutes and carrying out unification shaping, the fixed time pressure was able to be applied, next it was able to re-harden for 20 minutes at 160 **, this layered product (1) was able to be cut, and 1.6-mm-thick copper clad laminate was able to be obtained.

[0018]For 2100 ** of examples, and 20 minutes, after carrying out heat cure and carrying out unification shaping without pressure, except having re-hardened for 20 minutes at 160 **, after applying a fixed time pressure and heat, it was able to carry out like Example 1 and 1.6-mm-thick copper clad laminate was able to be obtained.

[0019]For 3100 ** of examples, and 20 minutes, after carrying out heat cure and carrying out unification shaping without pressure, except having applied a fixed time pressure and heat, it was able to carry out like Example 1 and 1.6-mm-thick copper clad laminate was able to be obtained.

[0020]For 1100 ** of comparative examples, and 20 minutes, after carrying out heat cure and carrying out unification shaping without pressure, except having re-hardened for 20 minutes at 160 **, it was able to carry out like Example 1 and 1.6-mm-thick copper clad laminate was able to be obtained.

[0021]Next, the curvature of the copper clad laminate obtained by Examples 1-3 and the comparative example 1 was evaluated. After melting copper foil in the copper clad laminate cut to 250 mm by 250 mm and drying at ordinary temperature by etching to it, it was made to dry at 170 ** for 0.5 hour, and put on the smooth surface plate, and the amount of the maximum reliefs was measured with the 1st class of JIS carpenter's square. as a result, to the laminate sheet which was boiled as usual and manufactured having been 5-6-mm curvature, all of Examples 1-3 are 1-2-mm curvature, and the laminate sheet manufactured by this example was able to reduce curvature from the thing of the comparative example 1.

[0022]After melting copper foil in the copper clad laminate cut to 250 mm by 250 mm and

drying at ordinary temperature by etching to it similarly, it was made to dry at 130 °C for 1 hour, and put on the smooth surface plate, and the amount of the maximum reliefs was measured with the 1st class of JIS carpenter's square. as a result, to the laminate sheet which was boiled as usual and manufactured having been 4-6-mm curvature, all of Examples 1-3 are 1-2-mm curvature, and the laminate sheet manufactured by this example was able to reduce curvature from the thing of the comparative example 1.

[0023]

[Effect of the Invention]According to the manufacturing method of the laminate sheet of this invention, the curvature of a laminate sheet and torsion can be prevented.

[Translation done.]